

REMARKS

Claims 1 to 18 and 20 to 27 were pending in the above-identified application when last examined. Applicant has amended claims 9 and 17.

Future Interview

Applicant thanks the Examiner for agreeing to grant the Applicant a telephone interview after receiving the present Response to the 1/25/05 Final Office Action in a voicemail left with the Applicant's attorney. Applicant will set up the interview with the Examiner in due course.

Ex. Parte Breslow

The Examiner cited Ex. Parte Breslow throughout the 1/25/05 Final Office Action. Applicant urges the Examiner to consider the reasoning behind the finding of Ex. Parte Breslow. While the Board of Appeals did find that "[d]ifferences between applicant's board-type game and prior art game that reside in meaning and information conveyed by printed matter would not be patentable differences," the reasoning behind this is that these "differences relate to the information or instructions conveyed by the printed matter and not in any structure per se." Ex. Parte Breslow, 192 U.S.P.Q. 431, 432 (1975) (emphasis added).

In addition, the Court of Customs and Patent Appeal has stated,

The fact that printed matter *by itself* is not patentable subject matter, because non-statutory, is no reason for ignoring it when the claim is directed to a combination. Here there is a new and unobvious functional relationship between a measuring receptacle, volumetric indicia thereon indicating volume in a certain ratio to actual volume, and a legend indicating the ratio, and in our judgment the appealed claims properly define this relationship. No question as to the novelty or unobviousness of the invention as claimed is before us except with relation to an "ordinary measuring vessel." By implication, the examiner admits that no such combination exists in or would be obvious from an ordinary measuring vessel and we therefore deem sections 102 and 103 to be satisfied.

In re Miller, 418 F.2d 1392, 1396 (CCPA 1969) (emphasis added). A copy of In re Miller is attached hereto for the Examiner. The Federal Circuit has more recently stated,

Differences between an invention and the prior art cited against it cannot be ignored merely because those differences reside in the content of the printed matter. Under section 103, the board cannot dissect a claim, excise the printed

matter from it, and declare the remaining portion of the mutilated claim to be unpatentable. The claim must be read as a whole.

In re Gulack, 703 F.2d 1381, 1385 (Fed. Cir. 1983) (emphasis added). A copy of In re Gulack is attached hereto for the Examiner.

Thus, the Applicant urges the Examiner to review the claims as a whole for structural and functional differences, and then determine the patentability of the claimed invention in view of the prior art.

§ 102 Rejections

The Examiner rejected claims 17, 18 and 25 to 27 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,607,160 ("Stevens et al."). Addressing claim 17, the Examiner stated that "Stevens teaches ... a religious-action mechanism (4:10-30)." 1/25/05 Final Office Action, p. 2, ¶ 1. Applicant respectfully traverses.

The Examiner cites col. 4, lines 10 to 30 of Stevens et al. for reciting "at least one of the spaces ... is a religious-action space that requires a playing team to perform a predetermined religious action associated with a religion" as recited in claim 17. The cited lines states:

Referring to FIGS. 1 through 3, the gameboard 1 is ready for play in the following manner. Each team, comprising of two or more players, chooses a colored game piece 21 to represent their team and its position on the game board and places that piece on the "D" (Draw) space marked Alpha/Omega 5. Teams roll the die 22 to select who begins first. The team with the highest roll begins first.

MOVEMENT ALONG THE PATH

Movement around the board is counterclockwise, first circling "Father" 25, then "Son" 26, then "Holy Spirit" 27. Teams advance around the board by correctly answering a Question 15, or identifying a Draw 18 or Act 19 that their teammate has selected from the playing cards 12. A team's turn continues until they are unsuccessful at answering a category or until they have successfully answered three consecutive categories.

Stevens et al., col. 3, lines 10 to 30 (emphasis added). The cited lines disclose Draw, Question, and Act spaces on the board wherein a team advances on the board when the team members correctly answer a question on the playing card or correctly identify a word on the playing card being drawn or acted out. Stevens et al. further describe the Act space as follows:

ACT

If a team starts their turn on an "A" (Act) space 8, a member of the playing team selects a playing card 12, rolls the die 22, and silently reads the three corresponding act words 19. The playing time begins when a member from an opposing team says, "Go", and starts the timer 20. The individual is then allowed to act out each word using any gestures, or available objects. The playing team, less the reader, has the allotted time to continue guessing the act words until each is identified. The actor may perform the words in any order. Upon successfully guessing one act word 19, the playing team advances one space and selects the first selection on a new playing card 12 in the new category of play. Upon successfully guessing two act words 19, the playing team advances two spaces and selects the second selection on a new playing card 12 in the new category of play. If the playing team identifies all three act words 19, they continue their turn by rolling the die 22, advancing the corresponding number of spaces, and selecting the same corresponding numbered selection 13 on a new playing card 12. No sounds or words may be used. There are no challenges on act words.

Stevens et al., col. 4, lines 7 to 30 (emphasis added). As the emphasized lines show, the Act space does not require the player to perform a predetermined action associated with a religion. Instead, the player can act out predetermined words on the playing cards "using any gestures, or available objects." Stevens et al., col. 4, lines 15 and 16.

While addressing other claims, the Examiner asserted Stevens et al. does require the players to perform a predetermined action associated with a religion.

Stevens further teaches performing a predetermined religious act (example: Passover) associated with the spaces marked with letter "A". Players landing on letter "A": spaces are required to perform a religious act as in "Passover".

1/25/05 Final Office Action, p. 5, ¶ 5 (emphasis added). Applicant respectfully traverses.

Passover is a Jewish holiday that commemorates the exodus of the Israelites from Egypt. Thus, a player can act out Passover in many ways for his or her teammates to guess the word "Passover." There is simply not a predetermined way of acting out Passover. Accordingly, claim 17 is functionally different than Stevens et al. for reciting "at least one of the spaces ... is a religious-action space that requires a playing team to perform a predetermined religious action associated with a religion." Claim 17.

In addition, claim 17 now recites "a religious-action space that requires a playing team to perform a predetermined religious action ... when a game token of the playing team advances to the religion-action space where the playing team loses its turn." Claim 17 (emphasis added). Thus,

when a playing team moves onto a religious-action space, the playing team loses its turn and honors this loss of turn by performing a predetermined religious action. This is functionally different from the Act space of Stevens et al. In Stevens et al, the playing team does not lose its turn when it lands on the Act space. Instead, the playing team has a chance to advance if the team correctly guesses a word being acted out by a team member. Thus, claim 17 is functionally different from Stevens et al.

The Examiner further rejected claim 17 as follows:

Stevens further teaches newly added limitations of spaces divided into religious sets (trinity). The examiner takes the position that many religions recognize sanctity of Father, Son and Holy spirit in some way or the other with different interpretations. For example the creator of the world is referred as Father in many religions.

1/25/05 Final Office Action, p. 2, ¶ 1. Applicant respectfully traverses.

The Examiner asserts that Stevens et al. discloses that "the spaces are divided into religion sets" because many religions recognize the Father, Son, and the Holy Spirit. However, the fact that many religions recognize a common deity or a common concept does not prove that Stevens et al. discloses a game about multiple religions. A review of the playing cards in Stevens et al. shows that all the questions and words to be identified by drawing or action are related to the Bible. For example, all the questions have references to where their answers can be found in the Bible. Thus, the Examiner has not identified anything in Stevens et al. that shows the questions relate to multiple religions, let alone that the spaces in the game path is divided into multiple religion sets. Accordingly, claim 17 is structurally different than Stevens et al.

Claims 18 and 25 to 27 depend from claim 17 and are patentable over Stevens et al. for at least the same reasons as claim 17.

§ 103 Rejections

The Examiner rejected claim 20 under 35 U.S.C. § 103(a) as being unpatentable over Stevens et al. in view of Ex. Parte Breslow. The Examiner stated:

Stevens teaches a game with trivia categories of "Father", "Son" and "Holy Spirit". Stevens further teaches newly added limitations of spaces divided into religious sets (trinity). The only difference between applicant's categories

(different religions) and the cited reference (Father, Son and Holy Spirit) resides in meaning and information conveyed by the printed matter that is not considered patentable Ex. Parte Breslow."

1/25/05 Final Office Action, p. 3, ¶ 3. Applicant respectfully traverses.

Stevens et al. does not disclose that its game path or its playing cards are divided into three religious categories of the Father, the Son, and the Holy Spirit. Stevens et al. only discloses that its game path encircles the words "Father," "Son," and "Holy Spirit." Stevens et al., col. 3, lines 21 to 22. These words are printed on the board to illustrate that the game is about the Bible but do not divide the game path into religion sets.

The word "Trinity" refers to the concept that the Father, the Son, and the Holy Spirit are three coexistent, co-eternal persons that make up God. This word is also printed on the game to allude to the three game types of Question, Drawing, and Acting in the game, which all have the same subject matter pertaining to the Bible. Stevens et al., col. 1, lines 18 to 21. Thus, claim 20 is structurally different than Stevens et al. for at least reciting the various religions in the religion sets. Furthermore, the Examiner has not provided any motivation as to why it would be obvious to divide the game path into religion sets. In addition, claim 20 depends from claim 17 and is patentable over the cited references for at least the same reasons as claim 17.

The Examiner rejected claims 1 to 8 and 21 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,120,066 ("Cohen") in view of Ex. Parte Breslow. The Examiner asserts that "Cohen teaches a game with trivia categories of 'words and subwords'." 1/25/2005 Final Office Action, p. 4, ¶ 4. Applicant respectfully traverses.

Cohen does not disclose a game with multiple trivia categories. Cohen discloses a single category in which the player attempts to match a keyword to one or more subwords.

The card 1 has two sides. FIG. 2 shows the front face 3, and FIG. 3 shows the reverse side 9. As is illustrated on the front face 3, there appears a keyword 5. In the present illustrated embodiment, the keyword is "AGGRESSIVE". Beside the keyword 5 is a subscript letter 7, the subscript being an "A", "N" or "V", representing the words "Adjective", "Noun" or "Verb". Below the keyword 5 and the subscript letter 7 there is a list of six subwords 4, 6, 8, 10, 12, 14 numbered 1 through 6, respectively. Within the subwords 4, 6, 8, 10, 12, 14 are either synonyms of the keywords, antonyms of the keywords, or both. On the reverse

side 9, in the present embodiment of the card 1, there is printed the keyword and an answer code 13, 11, one side 13 of the code showing which numbered subword 4, 6, 8, 10, 12, 14 was a synonym and the other code 11 showing which subwords 4, 6, 8, 10, 12, 14 were antonyms. For example, in FIG. 2 the keyword 5 is "Aggressive", the subwords 4, 6, 8, 10, 12, 14 numbered 1 through 6 are potential answers. In FIG. 3 the answer 13, 11 is shown as "2-S/3-A", meaning the subword numbered 2 is a synonym and the subword numbered 3 is an antonym.

Cohen, col. 5, lines 21 to 42.

The game recited in claim 1 is structurally different than the board game of Cohen. The game of claim 1 has a game path divided into religion sets and cards having questions pertaining to religions in those religion sets, whereas the board game of Cohen has a game path that is not divided into religion sets and cards pertaining only to matching a keyword to one or more subwords.

The Examiner further asserted that "[o]ne of ordinary skill in art ... would have suggested modifying game indicia to represent actions and questions from a plurality of different religions to attract players from different faith." 1/25/05 Final Office Action, p. 4, ¶ 4. Applicant respectfully traverses.

The Examiner's argument may be true to other board games where people have interest in multiple subjects under a general topic. For example, it may be obvious to make a board game with questions about multiple sports after the invention of a board game with questions about a single sport. This is because people tend to play multiple sports and have interest in multiple sports.

However, the same argument is not true for religious board games because people are generally single faith based (i.e., each person generally believes in only one religion). A single faith based person would not be motivated to create a game about multiple religions that may promote other faiths. This is especially true in today's world with so many conflicts between people of different faiths.

In addition, many religions have different and even conflicting beliefs. For example, some religions are monotheistic (the belief that there is only one God) while others are polytheistic (the belief that there are multiple Gods). A person of one religion would not be motivated to create a game that includes other religions having different and even conflicting beliefs. Accordingly, claim 1 is patentable over Cohen in view of Ex. Parte Breslow.


Claims 2 to 8 and 21 depend from claim 1 and is patentable over the cited references for at least the same reasons as claim 1.

The Examiner rejected claims 9 to 16 and 22 to 24 under 35 U.S.C. § 103(a) as being unpatentable over Stevens et al. in view of Ex. Parte Breslow. Claim 9 has similar limitations as claim 17. Thus, claim 9 is patentable over the cited references for at least the same reasons as claim 17.

Claims 10 to 16 and 22 to 24 depend from claim 9 and are patentable over the cited references for at least the same reasons as claim 9.

Conclusion

Claims 1 to 18 and 20 to 27 were pending in the above-identified application when last examined. Applicant has amended claims 9 and 17. For the above reasons, Applicant respectfully requests the Examiner to withdraw the claim rejections and allow claims 1 to 18 and 20 to 27. Should the Examiner have any questions, please call the undersigned at (408) 382-0480x206.

Certification of Facsimile Transmission	
I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.	
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Respectfully submitted,



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In re Miller
U.S. Court of Customs and Patent Appeals
December 18, 1969
418 F.2d 1392, 164 USPQ 46

Rich, Acting Chief Judge.

This appeal is from the decision of the Patent Office Board of Appeals affirming the rejection of claims 10-13 of application serial No. 332,183, filed December 20, 1963, entitled "Measuring Device." Claims 9 and 14 were allowed in the Examiner's Answer.

The disclosed invention has for its purpose the solving of the domestic culinary problem of measuring the ingredients from a cookbook recipe in something other than the full recipe. While it contemplates measuring out multiple recipes, for example a double recipe, it particularly contemplates solving the greater difficulty of measuring out fractional recipes, such as $1/3$ or $1/2$. Normally this would involve the calculation of such baffling measurements as $1/3$ or $2/3$ of a cup, which, it is assumed, would tax the mathematical abilities of many housewives. From the utility point of view, we will assume this to be so in the absence of any assertion by the Patent Office to the contrary. Indeed, we think we can judicially notice the fact.

While the rejection cites no references to establish prior art, we nevertheless have to take prior art into consideration because it is assumed on both sides that common kitchen measuring cups and spoons are well known. This is recognized by the specification which states:

The required measurements of ingredients of most recipes are in terms of the common fractions of cups, tablespoons, etc., appearing on commercially available measuring cups and spoons.

The problem faced by the housewife or other cook is stated in the specification as follows:

However, when a housewife wants to make a fractional recipe, few of the computed fractional measurements appear as graduations on commercially available measuring devices. Hence, even if the housewife is able to make the fractional or proportional computations or has a conversion chart, many of the computed measurements are only fractions of the graduations on the housewife's measuring devices. For example, even though a housewife is able to compute that $1/3$ of $2/3$ cup is $2/9$ cup, and $1/2$ of $3/4$ is $3/8$ cup, she will not find such fractional cup graduations on her measuring cup.

<418 F.2d 1394> We do not doubt that this presents a practical problem for many housewives, and for many cooks who are not housewives.

Appellant has provided equipment - <164 USPQ 47> articles of manufacture, under the statute, 35 U.S.C. 101-adapted to ameliorate the mental strain on cooks. The invention takes different forms. In the language of the claims there is, broadly, a measuring receptacle; more particularly, there is a spoon or a cupshaped receptacle. The first element of each claim is the *receptacle*.

The second element of each claim is, as stated in the specification:

* * * quantity measuring *indicia* on the receptacle of a selected ratio or proportion to, but different from the actual quantity measured in the receptacle by the *indicia*.
[Emphasis ours.]

To explain, the *indicia* on a cup or spoon may indicate, for example, that it is measuring one cup or one tablespoon but the actual volumetric content of the receptacle, reading the *indicia*, in whatever form they may take, against its contents, is something different, say $1/3$ cup or $1/3$ tablespoon. In other words, the *indicia*, if taken literally and by themselves, are false.

The third element in each appealed claim is a *legend*, on the receptacle or attached to it, specifying the ratio or proportion of a full recipe which the abovementioned false *indicia* actually measure in the receptacle. We do not use the term "false" in any derogatory sense; actually the false designation,

coupled with the legend, serves as a computing or mathematical conversion device. A cook following a cookbook recipe and desirous of making 1/3 of the recipe merely selects measuring devices bearing the "1/3 recipe" legend, follows the recipe using these devices, and measures out what it calls for by following the indicia on the measuring receptacles. They perform the calculations automatically and require no further thought.

Figs. 2 and 3 from the drawings are illustrative: [Figures omitted.]

Fig. 2 shows a measuring cup having the legend "ONE HALF RECIPE." The indicia on the side wall reading upward from 1/4 cup to 2 cups indicate the points at which the cup's volume is actually 1/2 of what the indicia state, i.e., filled to "2 CUPS" the actual volume is one cup. Similarly in Fig. 3, the <418 F.2d 1395> familiar set of measuring spoons has been altered in accordance with the invention so that, for example, the spoon 21 to the left bearing the indicia "1 TEASPOON" on its handle actually measures, in accordance with the legend 25, a half teaspoon.

Claim 10 is illustrative of the rejected claims (emphasis ours):

10. A measuring device comprising: a *spoon* for measuring ingredients; and volume measuring *indicia* defined in a normal volumetric unit on said spoon of a selected ratio to but indicating a volume different from the actual volume of ingredients being added to and measured in said spoon <164 USPQ 48> by said indicia, and a *legend* attached to said spoon specifying said ratio.

In his Answer, the examiner stated that no references were relied on. (Up to that point, it appears that his rejections had been based entirely on prior-art patents.) The rejection by the examiner which the board affirmed, and which is before us for review, was as follows:

Claims 10-13, which recite the combination of a measuring vessel having printed thereon (1) *indicia* specifying a given volume and (2) a *legend* specifying the ratio of this given volume to the actual volume that the vessel is capable of holding, are rejected as defining over any ordinary measuring vessel only by the addition of unpatentable printed matter. In this instance the claimed indicia and legend, being merely placed on the claimed structure in any desired location and manner, do not produce the required cooperative structural relationship necessary before the printed matter can be given patentable weight. It is believed to be well settled that patentable weight can be given printed matter only when a novel relationship exists between said printed matter and the claimed structure.

No authorities were cited by the examiner in his Answer, to support what he said was wellsettled law or otherwise. We consider the examiner's rejection unsound logically, if not self-defeating, and we reverse.

It is noted, first, that the examiner recognizes the invention of the appealed claims for what it is, namely, a combination of three elements constituting a "manufacture" 35 U.S.C. 101. There is no assertion that the *claimed* invention is non-statutory subject matter.

It is noted, next, that the rejection appears to be based either on 35 U.S.C. 103 or 112 by reason of the statement that it "[defines] over any ordinary measuring vessel only" in a certain respect. The statutory basis is not specified. Thus an "ordinary measuring vessel" is assumed prior art, notwithstanding no references are relied on. The respect in which the appealed claims admittedly *do* "define over" such prior art is in their recitations of the "indicia" and the "legend," two of the three elements of each rejected claim, as clearly recognized by the examiner. While the examiner was quite willing to consider such elements as proper parts of the "structure" and in "a definite structural relationship with the wall of the measuring vessel" when, as in the allowed claims, they were required to be in "a specific location," he would give them no weight at all, apparently, when the location was not specified or necessarily restricted. He said, and we repeat (our emphasis):

In this instance the claimed indicia and legend, being *merely placed on the claimed structure* [meaning the vessel] *in any desired location and manner*, do not produce the required co-operative *structural* relationship necessary before the printed matter can be given patentable weight.

We do not see why this is so and the examiner does not tell us.¹ We do not <418 F.2d 1396> see

that "structural" relationship-whatever that means-is required to obtain the practical, problem-solving results of appellant's invention. In fact, it is apparent that such restrictions as the examiner insists on would deprive the Fig. 3 embodiment of the invention of protection. Further, as the solicitor pointed out at the argument, if all of the indicia of the Fig. 2 cup except the "ONE HALF RECIPE" legend and the "2 CUPS" indicia were removed from Fig. 2, one would then have the subject matter of the appealed claims; yet, that subject matter would not be protected by the allowed claims.

It seems to us that what is significant here is not structural but *functional* relationship and that it is of no moment with respect to measuring devices such as the spoons, where the volume is measured by *filling the receptacle to its brim*, which could also be true of a cup, in what position on or relation to the receptacle the indicia and legend are placed. Claims 10-12 call for the indicia being "on" and the legend being "attached to" the receptacle. Claim 13 specifies that the indicia and the legend are both "on" the "cup-shaped receptacle." This specifies the required functional relationship to carry out appellant's invention and clearly defines the disclosed invention as required by section 112.

As for the examiner's characterization of the indicia and legend as "unpatentable printed matter," we note that the examiner himself recognizes the fact that <164 USPQ 49> printed matter, in an article of manufacture claim, *can* be given "patentable weight." He did so in allowing claims. His characterization of printed matter as "unpatentable" is beside the point; no attempt is here being made to patent printed matter as such. The fact that printed matter *by itself* is not patentable subject matter, because non-statutory, is no reason for ignoring it when the claim is directed to a combination. Here there is a new and unobvious functional relationship between a measuring *receptacle*, volumetric *indicia* thereon indicating volume in a certain ratio to actual volume, and a *legend* indicating the ratio, and in our judgment the appealed claims properly define this relationship. No question as to the novelty or unobviousness of the invention as claimed is before us except with relation to an "ordinary measuring vessel." By implication, the examiner admits that no such combination exists in or would be obvious from an ordinary measuring vessel and we therefore deem sections 102 and 103 to be satisfied.

The solicitor seeks some support for sustaining the rejection in *In re Sterling*, 21 CCPA 1134, 70 F.2d 910, 21 USPQ 519, but we find none therein. As we pointed out in *In re Jones*, 54 CCPA 1218, 373 F.2d 1007, 153 USPQ 77, also cited by the solicitor, the *Sterling* claims were held unpatentable over prior art references. The solicitor seems to urge that we *ignore* the claim limitations to the indicia and legends because they are printed and because printed matter is not patentable subject matter by itself. For reasons indicated above, we reject that argument.

The decision of the board affirming the rejection of claims 10-13 is *reversed*.

¹ The examiner did not care, apparently, where the *legend* was for in allowed claims 9 and 14 the legends were merely recited as "on said receptacle." But he did think the volumetric *indicia*, such as the "2 CUPS" scale on Fig. 2, *supra*, should have a *specific* relation to the receptacle other than merely being "on" it.

In re Gulack
U.S. Court of Appeals Federal Circuit
March 30, 1983
703 F.2d 1381, 217 USPQ 401

Smith, Circuit Judge.

This is an appeal from the decision of the U.S. Patent and Trademark Office Board of Appeals sustaining the rejection under 35 U.S.C. § 103 of claims 1-4 and 6 of application serial No. 93,183, filed August 18, 1978, entitled "Educational and Recreational Mathematical Device in the Form of a Band, Ring or Concentric Rings." We reverse.

I.

The stated object of the disclosed invention is to exploit certain arithmetic properties of all prime numbers larger than 5, P ,¹ to create the semblance of magic or to educate <217 USPQ 402> with respect to intriguing aspects of number theory.

A.

The physical configuration of the invention is extremely simple. The appealed claims recite three key elements: (1) a *band*, ring, or set of concentric rings; (2) a plurality of individual *digits* imprinted on the band or ring at regularly spaced intervals; and (3) an *algorithm* by which the appropriate digits are developed.

The band² serves two functions: it supports the sequence of digits and it presents the digits as an endless sequence with no discrete beginning or end. The band is preferably an endless loop of paper, fabric, <703 F.2d 1383> or plastic material. Specific embodiments of the invention set forth in the specification and appealed claims include a belt, hatband, headband, skullcap border, necklace, ring, table edge, household device or utensil, jewelry, and other artifacts.

The digits are integers, generated by the algorithm, and displayed at equal intervals on the outer surface of the band.

The algorithm for generating Q , the sequence of digits imprinted on the band, is also set forth in the specification.

A row of $P-1$ nines is always divisible by P to give a quotient Q which is an integral number.

Whenever a smaller number of nines is divisible by P to give an integral quotient Q , the number will always consist of some integral fractional part of $P-1$ nines, which may be designated as $P-1/n$ in which n is an integer greater than 1.

* * * It will be found that the number of digits in the quotient Q will always be $P1$ or some integral fraction of $P-1$. * * *

The specification describes three qualities of the sequence of digits Q , subject to manipulation for recreational or educational purposes. First, the digits have a "cyclic" nature.⁴ Second, the number of digits in the prime P will fix the maximum number of digits appearing in sequence in Q . For example,

[I]f P is 2 digits, Q or any multiple of Q , or cyclic variation of Q or any multiple of any cyclic variation of Q , if reduced to the original number of digits as aforesaid, will never contain any sequence of any 2 digits more than once. * * *

Finally, the digits of Q are subject to manipulation in accordance with procedures set forth in the

specification to produce a series of nines.

Appellant recommends the 180 digit quotient Q (derived from $P = 181$), because its length is sufficient to lend mystical qualities to the manipulation of the band yet short enough to be readily imprinted on the band. The MAGIC RING OF HAYIM, constructed in accordance with the appealed claims, is capable of manipulation as set forth in the specification to perform magic tricks or to display various aspects of number theory.

The appealed claims read as follows:

1. An educational and recreational mathematical device comprising at least one band which is endless or adapted to have ends thereof fastened to form an endless band and a plurality of individual digits imprinted on the band at regularly spaced intervals, the digits when all read consecutively clockwise as a number constituting a quotient obtained by dividing a number constituted of $P-1/n$ nines, in which P is a prime number greater than 5 and n is an integer at least 1, by P and adding to the lefthand end of said quotient any number of zeros necessary to increase the number of digits in said quotient to $P-1/n$, n being so selected that $P-1/n < 703 \text{ F.2d } 1384 >$ nines is the minimum number of nines divisible by P so that said quotient is an integral [sic] number.
2. Device according to claim 1, in which said band is endless.
3. Device according to claim 1, in which said band comprises an article of apparel.
4. Device according to claim 3, in which said band is part of a hat or cap.
6. Device according to claim 1 in which said band is an article of jewelry.

B.

The examiner rejected claims 1-4 and 6 on two grounds: as not directed to statutory subject matter, 35 U.S.C. § 101; and as unpatentable over Wittcoff,⁵ 35 U.S.C. § 103. The $<217 \text{ USPQ } 403 >$ board reversed the section 101 rejection, finding that the claims define an article of manufacture covered by 35 U.S.C. § 101.

In his section 103 rejection, the examiner stated that the appealed claims differed from Wittcoff only in the specific digits printed on the band. The examiner found no relationship between appellants digits and band except that the band is the surface on which the digits are printed. The examiner cited *In Re Miller*⁶ for the proposition that "[m]ere printed matter can not impart a patentable feature to a claim." Applying *Parker v. Flook*,⁷ the examiner viewed applicant's digits as well known and unable, therefore, to define over Wittcoff.

In affirming the 103 rejection, the board found no meaningful relationship between the digits and the band of the type indicated by the court in *Miller*.

Unlike the fact situation in *Miller*, the printed indicia claimed herein [convey] no meaningful information in regard to the substrate [they are] arranged on, [do] not require any size relationship of the substrate, and [do] not require any particular substrate to effectively convey the information. We are convinced that *there is no meaningful functional relationship between appellant's indicia and the claimed endless band.*

* * * In our opinion, the endless loop formed by the hatband with numerical digits printed thereon is the same structure claimed by appellant and *the sole difference is in the content of the printed material.* Accordingly, *there being no functional relationship of the printed material to the substrate, as we have noted above, there is no reasons [sic] to give patentable weight to the content of the printed matter which, by itself, is non-statutory subject matter.*

The rejection of claims 1 to 4 and 6 under 35 USC 103 is sustained. [Emphasis supplied.]

We understand the board as not giving the printed matter patentable weight because the board felt that there is no functional relationship between the printed matter and the substrate. In doing so, we do not interpret the board as holding that the printed matter can be ignored because it, by itself, is non-statutory subject matter. The board cited no authority in analyzing the relevance of the lack of a functional relationship, or of the status of the printed matter as non-statutory subject matter, to its decision not to accord the printed matter patentable weight. Because of the possible ambiguity of the board's articulation of its holding, we feel compelled to clarify the distinction.

<703 F.2d 1385> Differences between an invention and the prior art cited against it cannot be ignored merely because those differences reside in the content of the printed matter.⁸ Under section 103, the board cannot dissect a claim, excise the printed matter from it, and declare the remaining portion of the mutilated claim to be unpatentable. The claim must be read as a whole.⁹ If the board meant to disregard that <217 USPQ 404> basic principle of claim interpretation, we must reverse the rejection as a matter of law.

If, instead, the board sought only to construe and apply Miller within the context of a section 103 rejection, we find no error in the board's articulation of the law. Where the printed matter is not functionally related to the substrate, the printed matter will not distinguish the invention from the prior art in terms of patentability.¹⁰ Although the printed matter must be considered, in that situation it may not be entitled to patentable weight. This, apparently, was the board's conclusion with respect to Gulack's invention.

However, because we find that the digits of Gulack's invention are functionally related to the band, and because Wittcoff fails to disclose or suggest the subject matter recited in the appealed claims, considered as a whole, we reverse.

The sole issue is whether the board correctly affirmed the rejection of the appealed claims as obvious in view of Wittcoff under 35 U.S.C. § 103.

II.

The board, responding to appellant's arguments based on *In re Miller*,¹¹ found no functional relationship of the type present in *Miller*.

A.

Miller involved an appeal from the board's affirmance of the rejection of claims drawn to a measuring device for use in fractioning recipes. No statutory ground for the rejection was specified. The rejection in *Miller* was on the basis that the invention lacked "the required cooperative structural relationship necessary before the printed matter can be given patentable weight."¹²

<703 F.2d 1386> The CCPA¹³ responded, stating:¹⁴

[i]t seems to us that what is significant here is not structural but *functional* relationship
* * * * *

As for the examiner's characterization of the indicia and legend as "unpatentable printed matter," we note that the examiner himself recognizes the fact that printed matter, in an article of manufacture claim, can be given "patentable weight." He did so in allowing claims. His characterization of printed matter as "unpatentable" is beside the point; no attempt is here being made to patent printed matter as such. The fact that printed matter *by itself* is not patentable subject matter, because non-statutory, is no reason for ignoring it when the claim is directed to a combination. Here there is a new and unobvious functional relationship between a measuring *receptacle*, volumetric *indicia* thereon indicating volume in a certain ratio to actual volume, and a *legend* indicating the ratio, and in our judgment the appealed claims properly define this relationship. * * * [Emphasis in original.]

The court found that the printed matter of Miller's invention was functionally related to the volume measuring device and reversed the rejection.

B.

Similarly, in examining Gulack's invention, we find that a functional relationship does exist between the printed matter and the substrate. A functional relationship of the precise type found by the CCPA in Miller — to size or to type of substrate, or conveying information about substrate— is not required. What is required is the existence of differences between the appealed claims and the prior art sufficient to establish patentability. The bare presence or absence of a specific functional relationship, without further analysis, is not dispositive of obviousness. Rather, the critical question is whether there exists any new and unobvious functional relationship between the printed matter and the substrate.¹³ With these thoughts in mind we turn now to examine the obviousness of the appealed claims in light of the cited reference, Wittcoff.

III.

Appellant and the board agree that the sole difference between the appealed claims and Wittcoff resides in the content of the printed matter. The board declined, however, to accord that printed matter patentable weight.

Wittcoff discloses the application of printed matter to a band. The printed matter suggested by Wittcoff is data that is to be committed to memory, such as addition, subtraction, <217 USPQ 405> multiplication, history dates, historical personages, and the like. The data items are independent, bearing no direct relation to the other data entries on Wittcoff's band. The relationship of the Wittcoff data to the band is for purposes of support and display. The data must be imprinted on the band so that the answer to the inquiry displayed on the outer surface of the band is visible when viewed from inside the hat through the aperture. Wittcoff discloses an endless band, yet the areas of printed matter displayed on the Wittcoff band are not arranged in any particular sequence.

The appealed claims, on the other hand, require a particular sequence of digits to be displayed on the outside surface of a band. These digits are related to the band in two ways: (1) the band supports the digits; and (2) there is an endless sequence of digits — each digit residing in a unique position with <703 F.2d 1387> respect to every other digit in an endless loop. Thus, the digits exploit the endless nature of the band.

The differences between the appealed claims and Wittcoff reside in appellant's particular sequence of digits Q, and in the derivation of that sequence of digits. These features are critical to the invention disclosed by the appealed claims. Wittcoff neither discloses nor suggests either feature.

IV.

We reject the board's conclusion that there is no functional relationship between the printed matter and the substrate of the appealed claims. Such a relationship does exist and it is different from the relationship exhibited by the corresponding elements of the Wittcoff reference. We find no suggestion in the cited reference of appellant's particular sequence of digits Q or of the derivation of that sequence.

Reversed.

Friedman, Circuit Judge, dissenting.

I would affirm the Board's decision sustaining the rejection of the claimed invention as obvious under section 103.

The appellant's primary claim is for "[a]n educational and recreational mathematical device,"

namely, an endless band upon which are imprinted numbers in a particular sequence derived from the application of an algorithm. Subordinate claims describe the band as an article of apparel, part of a hat or cap, or an article of jewelry.

The algorithm is not patentable and “is treated as though it were a familiar part of the prior art” *Parker v. Flook*, 437 U.S. 584, 592 (1978). Similarly, the particular numbers produced by an abstract solution of the algorithm cannot themselves be claimed, although the practical application of those numbers may be patentable. See *In re Meyer*, 688 F.2d 789, 215 USPQ 193 (CCPA 1982); *In re Abele*, 684 F.2d 902, 214 USPQ 682 (CCPA 1982). The issue under section 103 is whether, to one of ordinary skill in the art of developing algorithms and applying their product for educational or recreational purposes, it would have been obvious to apply the algorithm by displaying the result of its solution on a continuous band, as the appellant disclosed in his patent application. The Board correctly answered that question affirmatively.

The Wittcoff patent teaches the use of a hatband to display numbers as an “educational or game-playing device.” Although there are differences between the display of numbers in appellant’s invention and their display in Wittcoff, it would have been obvious from Wittcoff for one of ordinary skill in the art who wanted to use the numbers the algorithm produced for appellant’s purposes, to display them on a continuous band. Indeed, one of the appellant’s subordinate claims displays the numbers on a hat or cap.

The display of the numbers on a band or other object that permits them to be shown in a series without a particular beginning or end would have been obvious even without Wittcoff. The numbers can be used for the recreational and educational purposes the appellant claims merely by arranging them in a continuous series. They do not need to be placed on an “endless band” as the appellant claimed. In fact, at oral argument the appellant conceded that the same result his invention accomplishes also could be accomplished by placing the numbers in a continuous series upon a cube or other shape, or even by writing them in a circle upon a flat surface. The precise nature of the object on which the numbers are placed is thus of little importance. The only matter that is of significance—the arrangement of the numbers as a continuous series—would have been obvious to anyone of ordinary skill in the art who knew the algorithm.

In *In re Miller*, 418 F.2d 1392, 164 USPQ 46 (CCPA 1969), as the court points out, the court determined that there was “a new and unobvious functional relationship” between the measuring receptacles and the descriptions and legends on <703 F.2d 1388> them. In the present case, unlike *Miller*, I do not think that the “functional relationship” between the numbers resulting from the application of the <217 USPQ 406> algorithm and their display upon the continuous band was new and unobvious.

¹ The variable P is defined in the specification as any prime number (an integer not divisible without remainder by any number except itself and unity) greater than 5. E.g., 7, 11, 13, etc.

² As stated by appellant in his specification band is intended to mean a band, ring, or set of concentric rings.

³ To illustrate:

If P = 7 (a prime greater than 5); then $Q = 999,999 \div 7$; that is $Q = 142,857$.

If P = 13, the smallest number of nines divisible by 13 that yields an integral quotient is 6, thus $Q = 999,999 \div 13$ or $Q = 76,923$.

(Note that in accordance with the specification, $(P-1) \div n = 6$, where $n = 2$, and $P = 13$.)

⁴ To simplistically illustrate this cyclic feature:

If $P = 7$;
then $Q = 142,857$, and $2Q = 285,714$.

The sequence of digits is the same in each number; the starting position has merely shifted.

⁵ E. Wittcoff, U.S. patent No. 2,796,680, issued June 25, 1957, for "Novelty Educational Hats." Wittcoff discloses a hat with an endless band having information printed in areas around both the inside and outside of the band. The hat has an aperture at the base of the crown through which an area of the band is viewed. The band can be rotated to align any specific area of information with the aperture. When an inquiry on the outside of the band is aligned with the aperture, the corresponding answer is viewed through the aperture from the inside of the hat.

⁶ In re Miller, 418 F.2d 1392, 164 USPQ 46 (CCPA 1969).

⁷ Parker v. Flook, 437 U.S. 584, 198 USPQ 193 (1978).

⁸ A "printed matter rejection" under § 103 stands on questionable legal and logical footing. Standing alone, the description of an element of the invention as printed matter tells nothing about the differences between the invention and the prior art or about whether that invention was suggested by the prior art. A printed matter rejection is based on case law antedating the 1952 patent act, employing a point of novelty approach. In re Sterling, 70 F.2d 910, 21 USPQ 519 (CCPA 1934). The 1952 act legislatively revised that approach through its requirement that the claim be viewed as a whole in determining obviousness. Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966). The CCPA has considered *all* of the limitations of the claims including the printed matter limitations, in determining whether the invention would have been obvious. See In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); In re Cavrich, 451 F.2d 1091, 172 USPQ 121 (CCPA 1971). In Royka, 490 F.2d at 985, 180 USPQ at 583, the CCPA, notably weary of reiterating this point, clearly stated that printed matter may well constitute structural limitations upon which patentability can be predicated.

⁹ 35 U.S.C. § 103 (1976) specifically provides that:

"A patent may not be obtained * * * if the differences between the subject matter sought to be patented and the prior art are such that *the subject matter as a whole* would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. * * * (Emphasis supplied.)

See Graham, 383 U.S. 1, 148 USPQ 459; Flook, 437 U.S. at 594 n.16, 198 USPQ at 199 n.16 (noting the § 103 requirement of reading claims as a whole and extending that requirement to § 101); Diamond v. Diehr, 450 U.S. 175, 188, 209 USPQ 1, 9 (1981) (also applying that requirement in a § 101 setting); Royka, 490 F.2d at 985, 180 USPQ at 583.

¹⁰ Miller, 418 F.2d 1392, 164 USPQ 46.

¹¹ Id.

¹² Id at 1395, 164 USPQ at 48.

¹³ The holdings of the United States Court of Customs and Patent Appeals and of the United States Court of Claims were adopted as precedent in the Court of Appeals for the Federal Circuit in South

Corp. v. United States, 690 F.2d 1368, 1370, 215 USPQ 657, 658 (Fed. Cir. 1982).

¹⁴ Miller, 418 F.2d at 1396, 164 USPQ at 48.

¹⁵ Id. at 1396, 164 USPQ at 49.